Remarks

Claims 28-49 are in the application. Claims 28, 34, and 38 are in independent form. Reconsideration is requested.

Claims 28-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Selker, US Patent No. 5,777,704, in view of Helms, US Patent No. 5,760,760. With regard to claims 28-44, 47 and 49, the Examiner cites Selker as disclosing the claimed subject matter, but not "an ambient light intensity control circuit." The examiner concludes that it would have been obvious to modify the Selker device to have an ambient light intensity control circuit for automatically adjusting the brightness level of a display device based on ambient lighting conditions, as described by Helms. Applicants respond as follows.

Amended independent claim 28 recites "illuminating the rear surface of the transmissive display panel simultaneously with a powered backlight and the diffuse ambient light directed toward the rear surface of the transmissive display panel," and independent claim 34 recites an analogous method step. Likewise, independent claim 38 recites "a backlight operable to generate and direct light at the rear surface of the transmissive display panel simultaneously with the diffuse ambient light being directed toward the rear surface of the transmissive display panel."

Applicants submit that the cited references do not teach or suggest providing illumination to a display panel with ambient light and a backlight simultaneously, as recited in the claims. Selker describes the artificial light source and diffuser 205 as providing backlighting of the LCD 209 when lid 201 is closed against the back of LCD 209. (Selker, col. 4, lines 51-60.) When lid 201 is closed against the back of LCD 209, no ambient light can reach the LCD 209 of Selker. Selker provides no teaching or suggestion of providing illumination to a display panel with ambient light and a backlight simultaneously.

Moreover, each of the independent claims recites use of an ambient light diffuser to provide diffuse ambient light to illuminate the rear surface of the transmissive display panel. Neither of the cited references teaches or suggests providing diffuse ambient light to illuminate a transmissive display device.

The diffuser of Selker is directed solely to use with artificial light, not ambient light. Selker recites "an artificial light source and diffuser 205 in the form of a lightpipe edge mounted around the reflective surface 203," as shown in Fig. 2. (Selker, col. 4, lines 36-39.) Selker describes the artificial light source and diffuser 205 as providing backlighting of the LCD 209 when lid 201 is closed against the back of LCD 209. (Selker, col. 4, lines 51-60.) The exclusive use of the edge-mounted diffuser 205 of Selker with artificial light is emphasized in claim 1 of Selker, which recites "means for providing diffused artificial backlighting of the LCD." (Selker, col. 5, lines 31-32.) Helms does not even mention use of ambient light to illuminate the transmissive display

Rejection of a claim over prior art requires that the prior art teach or suggest every feature recited in the claim. The cited references fail to teach or suggest illumination of a transmissive display panel with ambient light and a backlight, simultaneously, and also fail to teach or suggest use of diffuse ambient light for such illumination. As a result, applicants submit that independent claims 28, 34, and 38 are patentably distinct from the cited references and request that the rejections be withdrawn.

Applicants believe that dependent claims 29-33, 35-37, and 39-49 are allowable as dependents of independent claims 28, 34, and 38. Applicants believe that dependent claims are further allowable for the following reasons.

As amended, claims 30, 31, 36, 37, 40, and 41 recite detecting the amount of light at about the light-receiving rear side of the display panel, the light at about the light-receiving rear side of the display panel including diffuse ambient light from the ambient light diffuser and light provided by the powered

backlight. The Examiner cites Helms as disclosing a rear photo-sensor at column 5, lines 12-19. Applicants note, however, that the photodetector 410 of Helms is shown in Fig. 4 and described at column 5, lines 8- 11, as being positioned on the outside rear of the LCD case and as detecting light directed toward a user's eyes.

Helms provides no teaching or suggestion of detecting the amount of light provided by a powered backlight, as well as diffuse ambient light from an ambient light diffuser, at about the light-receiving rear side of the display panel. The light detection of claims 30, 31, 36, 37, 40, and 41 provides detection of the amount of light to be directed through a transmissive display panel from two specific sources. The light detector of Helms does not teach or suggest detection of either source of light for illuminating a display panel. Rather, Helms is directed to detecting light that is not transmitted through the display panel. Applicants submit, therefore, that claims 30, 31, 36, 37, 40, and 41 are further allowable over the cited references.

Amended claims 33, 34, and 43 recite that controlling the illumination of the rear surface of the transmissive display panel with the powered backlight includes minimizing power delivered to the powered backlight to achieve the user selected brightness level, wherein minimizing illumination of the rear surface of the transmissive display panel with the powered backlight includes turning the powered backlight completely off while maintaining the user selected brightness level. Such minimization is described in the application at page 8, lines 10-23, for example, and can be achieved because the transmissive display panel is illuminated from the rear by a backlight and diffuse ambient light. In contrast, Helms provides no basis for transmissive illumination with ambient light and hence no basis for minimizing power delivered to a backlight, including turning it off, while maintaining a user selected brightness level. Applicants submit, therefore, that claims 33, 34, and 43 are further allowable over the cited references.

With regard to claims 45-47, the Examiner notes that the cited references do not teach or suggest a pivot "located at a bottom edge or top edge of the display panel." Citing In re Japikse, 86 USPQ 70, the Examiner then concludes that it would have been obvious to modify the pivotal (e.g., hinge) coupling of Selker "since it has been held that rearranging parts of an invention involves only routine skill in the art." Applicants respond as follows.

Applicants first note that the Examiner has mischaracterized the precedent set by In re Japikse. As stated at MPEP 2144.04, In re Japikse is deemed to provide that "claims to a hydraulic power press which read on the prior art except with regard to the position of the starting switch were held unpatentable because shifting the position of the starting switch would not have modified the operation of the device." The MPEP therefore notes that In re Japikse relates to features that "would not have modified the operation of the device," like the position of a starting switch. In contrast, the locations of pivotal couplings recited in claims 45-47 relate specifically to the operation of the present invention, namely providing ambient light to illuminate to a transmissive display panel.

In claim 46, for example, the positioning of the pivotal coupling between the transmissive display panel and the diffuser along the top edge of the display panel, as shown in application Fig. 5, allows the diffuser to be positioned behind the display panel. Such positioning of the diffuser is relevant and "modifies the operation of the device" because the ambient light that illuminates the rear of the display panel comes from behind it. Therefore, the precedent of In re Japikse does not support rejection of claims 45-47, and the rejection should be withdrawn.

Claims 38-49 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 30, 33, and 41 of copending application No. 09/299,521. The Examiner states that although the conflicting claims are not identical, they are not patentably

distinct from each other because both this application and co-pending application disclose the same display device. Applicants respond as follows.

An obviouness-type double patenting rejection must be based upon the claims of the respective applications. In particular, the Examiner must show that the claims of one application are "obvious" over the claims of the other. In the present application, the Examiner has made no such showing. Instead, the Examiner states that the applications disclose the same display devices, not that the claims of one application are obvious over the claims of the other. Applicants submit that the rejection for obviousness-type double patenting is therefore improper as being based upon the disclosures of the applications rather than the claims. Moreover, applicants submit that the claims of the present application and copending application No. 09/299,521 are patentably distinct from each other.

Claims 33 and 41 of copending application No. 09/299,521 have been cancelled. The subject matter of claim 33 has been incorporated into its dependent claims 34 and 35, and the subject matter of claim 41 has been incorporated into its dependent claims 42 and 43. With the provisional rejection not based upon any of claims 34, 35, 42, or 43 of copending application No. 09/299,521, applicants submit that the provisional rejection with regard to claims 33 and 41 should be withdrawn.

Claim 30 of copending application No. 09/299,521 recites (1) a transmissive reflector located behind said non-viewing surface of the display panel (e.g., a partially transmissive reflector) and (2) two or more devices for directing at least some of the diffused-ambient light through the transmissive reflector and the non-viewing surface of the display panel, the two or more devices forming sidewalls. Nothing in the claims of the present application provides any teaching or suggestion of a transmissive reflector or two or more devices for directing at least some of the diffused-ambient light through the transmissive reflector.

The claims of the present application do not recite a transmissive reflector or two or more devices for directing at least some of the diffused-ambient light through the transmissive reflector. The claims of copending application No. 09/299,521 provide no teaching or suggestion of controlling artificial backlight relative to ambient lighting. Applicants submit, therefore, that the rejection for obviouness-type double patenting is improper and request that the rejection be withdrawn.

Applicants believe the application is in condition for allowance and respectfully request the same.

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Attachment
Claims 28-49
Application Number: 09/299,522

28. (Amended) A method of controlling backlight illumination of a transmissive display device having a transmissive display panel with a viewing front side a light-receiving rear side, the method comprising:

receiving ambient light at an ambient light diffuser and directing diffuse ambient light toward the rear surface of the transmissive display panel to illuminate it;

illuminating the rear surface of the transmissive display panel simultaneously with a powered backlight [simultaneously while directing] and the diffuse ambient light directed toward the rear surface of the transmissive display panel; and

controlling the illumination of the rear surface of the transmissive display panel with the powered backlight according to a detected amount of ambient light.

29. The method of claim 28 in which the controlling of the illumination of the rear surface of the transmissive display panel includes detecting the amount of ambient light at about the viewing front side of the display panel.

30. (Amended) The method of claim 29 in which the controlling of the illumination of the rear surface of the transmissive display panel includes detecting the amount of [ambient] light at about the light-receiving rear side of the display panel, the light at about the light-receiving rear side of the display panel including diffuse ambient light from the ambient light diffuser and light provided by the powered backlight.

31. (Amended) The method of claim 28 in which the controlling of the illumination of the rear surface of the transmissive display panel includes detecting the amount of [ambient] light at about the light-receiving rear side of the

display panel, the light at about the light-receiving rear side of the display panel including diffuse ambient light from the ambient light diffuser and light provided by the powered backlight.

32. The method of claim 28 further including receiving a brightness setting signal indicative of a user selected brightness level and controlling the illumination of the rear surface of the transmissive display panel with the powered backlight according to the detected amount of ambient light and the user selected brightness level.

33. (Amended) The method of claim 32 in which controlling the illumination of the rear surface of the transmissive display panel with the powered backlight includes minimizing power delivered to the powered backlight to [achieve] maintain the user selected brightness level, wherein minimizing power delivered to the powered backlight includes turning the powered backlight completely off while maintaining the user selected brightness level.

34. (Amended) A method of controlling backlight illumination of a transmissive display device according to a user selected brightness level, the display device including a transmissive display panel having a viewing front side a light-receiving rear side, the method comprising:

receiving ambient light via an ambient light diffuser and directing diffuse ambient light toward the rear surface of the transmissive display panel to illuminate it;

illuminating the rear surface of the transmissive display panel simultaneously with a powered backlight [simultaneously while directing] and the diffuse ambient light directed toward the rear surface of the transmissive display panel; and

minimizing the illumination of the rear surface of the transmissive display panel with the powered backlight according to the user selected brightness level and the detected amount of ambient light, wherein minimizing illumination of the

rear surface of the transmissive display panel with the powered backlight includes turning the powered backlight completely off while maintaining the user selected brightness level.

35. The method of claim 34 in which the controlling of the illumination of the rear surface of the transmissive display panel includes detecting the amount of ambient light at about the viewing front side of the display panel.

36. (Amended) The method of claim 35 in which the controlling of the illumination of the rear surface of the transmissive display panel includes detecting the amount of [ambient] light at about the light-receiving rear side of the display panel, the light at about the light-receiving rear side of the display panel including diffuse ambient light from the ambient light diffuser and light provided by the powered backlight.

37. (Amended) The method of claim 34 in which the controlling of the illumination of the rear surface of the transmissive display panel includes detecting the amount of [ambient] light at about the light-receiving rear side of the display panel, the light at about the light-receiving rear side of the display panel including diffuse ambient light from the ambient light diffuser and light provided by the powered backlight.

38. (Amended) A transmissive display device, comprising:

a transmissive display panel having a viewing front side a light-receiving rear side;

a transmissive ambient light diffuser through which ambient light passes to form diffuse ambient light that is directed toward the rear surface of the transmissive display panel;

a backlight operable to generate and direct light at the rear surface of the transmissive display panel simultaneously with the diffuse ambient light being directed toward the rear surface of the transmissive display panel;

an ambient light detector for detecting an amount of ambient light at about at least one of the front and rear sides of the display panel; and

a backlight intensity control circuit for controlling the intensity of the backlight according to a detected amount of light at about at least one of the front and rear sides of the display panel.

39. The display device of claim 38 in which the ambient light detector detects the amount of ambient light at about the viewing front side of the display panel.

40. (Amended) The display device of claim 39 in which the ambient light detector detects the amount of [ambient] light at about the light-receiving rear side of the display panel, the light at about the light-receiving rear side of the display panel including diffuse ambient light from the ambient light diffuser and light provided by the powered backlight.

41. (Amended) The display device of claim 38 in which the ambient light detector detects the amount of [ambient] light at about the light-receiving rear side of the display panel, the light at about the light-receiving rear side of the display panel including diffuse ambient light from the ambient light diffuser and light provided by the powered backlight.

42. The display device of claim 38 further comprising a user accessible brightness control coupled to the backlight intensity control circuit for providing a brightness setting signal indicative of a user selected brightness level, wherein the intensity of the backlight is controlled according to the detected amount of ambient light and the user selected brightness level.

43. (Amended) The display device of claim 42 in which controlling the intensity of the backlight includes minimizing power delivered to the backlight to [achieve] maintain the user selected brightness level, wherein minimizing illumination of the rear surface of the transmissive display panel with the powered

backlight includes turning the powered backlight completely off while maintaining the user selected brightness level.

44. The display device of claim 38 in which the display panel includes a liquid crystal cell.

45. The display device of claim 38 further comprising a pivotal coupling between the transmissive display panel and the diffuser so that the transmissive display panel and the diffuser are pivotable relative to each other.

46. The display device of claim 45 in which the display panel in a viewing position has a bottom edge and a top edge, the pivotal coupling between the transmissive display panel and the diffuser extending along the top edge of the display panel.

47. The display device of claim 38 further comprising a reflective surface that is positionable by a user to receive ambient light and reflect it toward the rear surface and though the transmissive display panel.

48. The display device of claim 47 further including a pivotal coupling between the transmissive display panel and the reflective surface so that the transmissive display panel and the reflective surface are pivotable relative to each other.

49. The display device of claim 38 in which the ambient light diffuser includes a transmissive ambient light diffuser through which ambient light passes.